

COMPETENCIES FOR GAINFUL EMPLOYMENT BY DEALERSHIPS OF THE
FARM MACHINERY INDUSTRY IN NORTHEAST KANSAS

by

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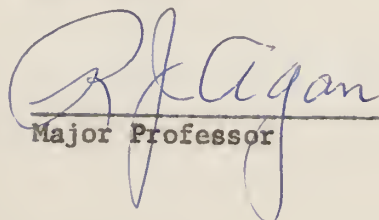
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INTRODUCTION

This report concerned a study of competencies which were needed by employees of farm machinery dealers. The writer had been a resident for nineteen years of northeast Kansas, the area of study. The study resulted from many observations made by the writer as a teacher of vocational agriculture. One observation which was judged as pertinent to the study by the writer was the percentage of vocational agriculture students who graduated from the Atchison County Community High School, Effingham, Kansas, who obtained non-farm occupational employment. From 1960 to 1965, 24 per cent obtained non-farm occupational employment compared to 5.4 per cent from 1940 to 1945.

The Kansas State Board of Agriculture records listed the average size farm in Atchison County as 145 acres in 1945.¹ The United States Department of Agriculture, Soil Conservation Service, Effingham, Kansas, records listed the average size farm in Atchison County as 236 acres in 1966, an increase of 61 per cent. This change brought about a condition, as observed by the writer, which resulted in a price-cost squeeze and encouraged farmers to purchase larger machines and operate larger acreages for increased profits to cope with the rising economic conditions. The trend had continued toward fewer but larger farms and fewer persons in farming. Because of this observed trend and the amount of capital

¹Kansas State Board of Agriculture, 35th Biennial Report, 1945-1946 (Fred Voiland, Jr., State Printer, Topeka, Kansas, 1946), p. 457.

required it was an assumption of this study that it had become increasingly difficult for young men to become established in farming.

This study followed one made by Howard R. Bradley, who surveyed the occupational status of Kansas' 1,959 high school graduates having four or more units of vocational agriculture as of January, 1960 to 1964. He found in his study that 13.4 per cent were employed in non-farm occupations in 1960 and 25.9 per cent in 1964.¹ This study centered about the assumption that if the vocational agriculture departments were to continue to reach the needs of farm boys in the community, they must train boys for employment in farm related occupations.

It was further an observation that the increased investment per acre in farm machinery designed to save the farmer time and labor had increased the volume of business with farm machinery dealers. The high demand for immediate delivery of new machines, the repair and servicing of old machines had increased the need for more skilled men. It had been the experience of the writer that farm machinery dealers had asked instructors of vocational agriculture to train boys for employment after graduation in tractor service and overhaul, farm machinery repair, farm machinery assembly and adjustment for field operation. The author further made the study in an effort to assist farm machinery dealers in obtaining skilled men for employment.

¹Howard R. Bradley, "Agriculture in Kansas Area Vocational Schools," Agricultural Education Magazine, April, 1965.

STATEMENT OF THE PROBLEM

This study was based on the foregoing observations, assumptions and experiences of the writer who identified the central problem of the study as one to discover some competencies needed by employees of farm machinery dealers in order that vocational agriculture departments, area vocational technical schools and junior colleges could qualify their graduates for gainful employment with farm machinery dealers. The problem was designed to provide guide lines for a curriculum for training which would include competencies considered as essential in importance for areas of activity in all farm machinery dealerships.

OBJECTIVES

Seven objectives were listed for the study. The fulfillment of the objectives were limited to the ability of the farm machinery dealers to respond accurately to the questions and the ability of the researcher to interpret his answers.

1. Survey what competencies farm machinery dealers felt were required for the gainful employment of their employees.
2. Formulate some guide lines in developing a curriculum for training, which would include competencies considered as essential in importance for all areas of activity in farm machinery dealerships.
3. Survey the differences in the number of competencies an employee needed to be trained to perform, between the employee of a farm machinery

dealership where there were several to a town and an employee of a dealership where there was one to a town.

4. Survey whether farm machinery dealerships would express a desire to employ additional trained men.

5. Survey whether farm machinery companies sponsored service clinics for mechanics, machinery adjusters, parts personnel, machinery assemblers and sales personnel.

6. Develop a list of different farm machines that were reported to be repaired and serviced by farm machinery dealers.

7. Develop a list of services farm machinery dealers intended to add in the next year or two following the study.

REVIEW OF SELECTED LITERATURE

In preparation for the study a survey of literature was made in the Agricultural Education Magazines which were on file in the personal library of the author and the reports of special studies which advisors to the study indicated. No studies were found which were identical to the one being planned. Four studies were selected for review as background for this study.

Harold F. Engelking, Supervisor of agricultural education who resided in Springfield, Illinois, wrote a report concerning the development of a farm mechanics course for 40 young men who were starting a two year post high school training program in Canton Community College, Canton, Illinois. He reported the findings made through a local survey.

In his report he wrote,

A local survey indicated that practically every implement dealer needed at least one more mechanic. Approximately 500 farm implement mechanics are needed in Illinois, and it has been estimated that 15,000 are needed nation wide. The average age of farm implement mechanics in the labor force today is 49 years.¹

Norman N. Robinson, teacher of vocational agriculture, Knoxville, Iowa, made a study by questionnaire of 200 farmers who graduated from high school during the years 1950 to 1954 and another 200 farmers who were recommended as outstanding machinery using farmers well scattered throughout Iowa. He reported, "Both groups of farmers indicated they needed the most competency in tractor overhaul, adjusting tractor hydraulic systems and adjusting and overhauling tractor carburetors, in that order."²

Alan A. Kahler and Clarence E. Bundy, professors on the teacher education staff in agricultural education at Iowa State University, conducted a study by questionnaire using a sample of 136 outstanding farm implement dealers and their employees in Iowa to determine if males employed in retail farm machinery distribution needed to possess competencies in agriculture in order to efficiently carry out the functions of their jobs. In their study they reported,

¹Harold F. Engelking, "The Birth of a Program," Agricultural Education Magazine, March 1966, p. 198.

²Norman Robinson and Duane L. Blake, "Content for Today's Farm Machinery Instruction," Agricultural Education Magazine, March 1965, p. 226.

For the abilities, highest mean score for service employees were found for the ability to adjust and repair carburetors and electrical systems, adjust and repair diesel fuel injectors and fuel pumps, calibrate farm machines, and use of both arc and oxyacetylene welders in making special process welds.¹

Kansas State University researchers completed a study in June of 1963 concerning the concept of special vocational training for present and prospective employees of 500 Kansas employers in agriculture non-farm occupations. In one phase of the study the employers were asked to select from a list of 46 technical subject matter areas the special areas of knowledge needed by the workers. The findings were written,

Following are the subject matter areas in the order of importance:

1. General agriculture knowledge (current). 2. Salesmanship.
3. Tractor, power units, and mechanics. 4. Soils and crops.
5. Agriculture chemicals, insect and pest control.²

DEFINITION OF TERMS

Certain selected terms were set aside and given special definition for the purposes of this study. The definitions might or might not be those considered to be of common usage.

Farm Machinery Dealer. For the purposes of this study a merchant who sold and/or repaired farm machinery and who employed a minimum of 5 persons, of which at least one had a title of shop foreman, machinery set-up man, or farm machinery serviceman, and someone

¹Alan A. Kahler and Clarence E. Bundy, "Competencies Needed for the Farm Machinery Worker," Agricultural Education Magazine, April 1965, p. 256.

²R. J. Agan, "Kansas Studies Agriculture Non-farm Occupations," Agricultural Education Magazine, July 1964, p. 15.

who was the employer. (Listed in the Dictionary of Occupational Titles.) Sometimes such merchants were referred to as Dealerships and/or Dealers.

Skills. In this study, skills referred to manual dexterity needed as opposed to facts or knowledge as the only criteria to holding the job successfully.

Occupation. For the purposes of this study, a vocation for gainful employment.

Trainee. Referred to anyone gainfully employed while learning a trade.

Vocational Agriculture Department. In this study, those departments teaching agriculture which were reimbursed by the Kansas State Board for Vocational Education.

Curriculum. For the purposes of this study, curriculum referred to a prescribed course of study in a university, school, etc.

SCOPE AND PROCEDURE

In order to meet the objectives set forth by the study, a survey of the competencies that were felt by the farm machinery dealers to be essential to qualify men for occupational employment with farm machinery dealers in northeast Kansas, was developed in the form of a questionnaire. The instrument contained six information and status questions; 93 questions concerning competencies covering eight areas of activity as follows: 8 competencies of employer, employee, and customer relationship; 33 competencies, servicing tractors; 24 competencies, tractor overhaul;

8 competencies, hydraulic system; 8 competencies, tractor transmission and differential; 12 competencies, machinery repair; 4 competencies, machinery adjustment; 6 competencies, machinery assembly. The competencies were selected partially from the report of a special problem study made by a student (Charles Schaller) of Professor Clinton Jacobs, Department of Agricultural Engineering, Kansas State University. He surveyed farm machinery dealers in northwest Kansas, farm power and machinery manuals and operators manuals from machinery companies.

Dr. James Albracht, Agricultural Education Department, Kansas State University, reviewed the questionnaire and his suggestions were incorporated. To test the questionnaire for proper procedure, a personnel interview was made with the owner and manager of one farm machinery dealership not included in the study. After the test, minor adjustments were made as indicated by the experience.

The responses given to the questionnaire by the dealers were analyzed by assigning a weighted value to the responses given to items 7 through 99. Items which were rated as: "Essential" were assigned 4 points; "Very Important" 3 points; "Important" 2 points; "Little Importance" 1 point; and "No Importance" 0 points. (See questionnaire in Appendix.)

In order that the findings of this study meet the objectives of formulating guide lines in developing a curriculum for training (see objective number 2), it was the decision of the author that the competencies that received an average weighted rating of "Essential," (3.0 to 4.0 points) by the ten farm machinery dealers be given special

consideration by those who develop curriculum guides for the teaching of competencies in this area.

A list of farm machinery dealers was obtained from J. Keith Melvin, Executive Director, Western Retail Implement and Hardware Association, Kansas City, Missouri.

A selection of five farm machinery dealers in Atchison, Kansas, and five area farm machinery dealers, one dealership to a town, nearest to Effingham, Kansas, were selected for the study. Dr. R. J. Agan, advisor and consultant to the author, considered the 30 farm machinery dealerships, selected from a list of 30 a sample of ten for comparison and arriving at the objectives of the study. (See list of dealerships in Appendix.)

To the manager or manager and owner of each dealership, a personal form letter was sent explaining the purpose of the study and informing them that the author would contact them for a personal interview to complete the questionnaire. The letter was co-signed by Lee R. Cashman, Superintendent of Schools, Unified School District Number 377, Effingham, Kansas, and mailed out March 8, 1967. (See Appendix.)

The author developed an interview statement that was read to each farm machinery dealer before filling out the questionnaire. (See copy of statement in Appendix). All ten interviews were completed by April 8, 1967.

FINDINGS OF THE STUDY

Machinery Dealers

The ten farm machinery dealers assisting with the study were located in Atchison, Brown, Doniphan and Jefferson counties of northeast Kansas. (See map in Appendix.) These four counties had a total of 5,272 farms, by 1959 census; followed a diversified type of farming, growing corn, grain sorghum, and oats mainly for livestock feed; wheat and soybeans for a cash crop; alfalfa, red clover, native grasses, forage sorghums and silage corn for hay; pasture and silages as roughage for livestock feeds.¹

All the farm machinery dealerships offered for sale and serviced implements, including tractors, used for tilage and harvesting operations for crops mentioned in the preceding paragraph. These farm machinery dealers also operated a used tractor and machinery business, which included trade-in's, tractors and machinery purchased at farm sales, outright purchases, or repossessed. This used equipment consisted of tractors and machinery manufactured by different companies, requiring tractor servicing, tractor overhaul, machinery repair and adjustment.

One machinery dealer commented that the used equipment phase of the business was a critical area and pointed out that he felt it was necessary to attend public farm sale auctions in order to purchase items

¹Kansas State Board of Agriculture, Farm Facts, 1965-1966, (Robert R. Sanders, State Printer, Topeka, Kansas) 1966, p. 16F.

selling as cheaply as to affect the market price of used farm machinery.

The machinery dealers included in this study were divided into two categories. The first category was "The Five Machinery Dealers, One to a Town" and the second category was "The Five Atchison Farm Machinery Dealers."

The Five Machinery Dealers, One to a Town. The Doniphan County Equipment, Incorporated, located in Troy, Kansas, had an International Harvester franchise, employed eight men full time and one man from March to November. Troy had a population of 1,113 people, located in the near center of Doniphan County having 1,065 farms.^{1, 2} The nearest International Harvester dealerships were located in St. Joseph, Missouri, 25 miles, and Hiawatha, Kansas, 26 miles.

The R & S Implement Company, Horton, Kansas, had a John Deere franchise and employed nine men full time and one man from March to November. Horton had a population of 2,361 people, was located in the south central part of Brown County with 1,410 farms, 3 miles northeast of Jackson County, 1,476 farms, and 1 mile north of Atchison County with 1,142 farms.^{3,4} The nearest John Deere dealership was 13 miles north

¹World Atlas, Hammond Incorporated, Copyright, 1966, (Maplewood, New Jersey), p. 231.

²Kansas State Board of Agriculture, op. cit.

³Ibid.

⁴Ibid.

to Hiawatha and 26 miles southwest to Holton.

The Hutchison Implement Company, Everest, Kansas, had an Allis Chalmers franchise and employed seven men full time and two men from March to November. Everest had a population of 348 people, was located in the southeast part of Brown County, bordering Atchison County 1 mile south and Doniphan County 4 miles east.¹ The nearest Allis Chalmers dealership was 19 miles northwest to Hiawatha, 22 miles southeast to Atchison and 33 miles southeast to Holton, Kansas.

Tom Miller Implement Company, Highland, Kansas, had a John Deere franchise, employed ten men full time and one man from March to November. The dealer was advertising for two additional men full time in the tractor overhaul department. Highland had a population of 755 people, was located in the north central part of Doniphan County.² The nearest John Deere dealerships were 14 miles west to Hiawatha, 27 miles southwest to Horton and 27 miles east to St. Joseph, Missouri.

Valley Implement, Incorporated, Valley Falls, Kansas, had an International Harvester franchise, employed five men full time and two men from March to November. The dealer said he would hire two additional qualified men in the tractor overhaul department full time. Valley Falls was located in the northeast part of Jefferson County with 1,355 farms, 6 miles from the southwest corner of Atchison County, and 8 miles from

¹Ibid.

²Ibid.

the east central part of the Jackson County line.¹ The nearest International Harvester dealerships were Nortonville, 14 miles northeast, and Holton, 21 miles northwest.

The Five Atchison Farm Machinery Dealers. Atchison located on the eastern central border of Atchison County, Kansas, the western bank of the Missouri River, had a population of 12,529 people.² Atchison County had 1,142 farms reported by the 1966 census.³ The Atchison farm machinery dealers did business with the Missouri River bottom land farmers. One dealer commented, "I estimate that 40 per cent of my business is in Missouri."

Allen Motor and Implement Company, employed four men full time and three men during the busy season, March to November. The dealership had a Massey Ferguson franchise and intended to increase the size of the facility for more efficiency in the machinery assembly and machinery repair departments. The improvement he estimated would add two or three more men full time. The nearest Massey Ferguson dealerships were 30 miles south to Leavenworth, Kansas, 32 miles northeast to St. Joseph, Missouri, and 33 miles west to Holton, Kansas.

¹Ibid.

²World Atlas, op. cit.

³Ibid.

The D & W Tractor Service employed four men full time and two men from March to November. The owner stated that the agency started from the beginning doing tractor servicing and tractor overhaul. They didn't possess an implement franchise, but sold tractors and implements not handled by other dealers in Atchison, but purchased them through the John Deere and the International Harvester dealerships located in St. Joseph, Missouri.

The Handke Tractor and Implement Company had a Case franchise and employed three men full time and two men from March to November. They expressed the desire to hire one or two men full time skilled to service and overhaul diesel engines and hydraulic systems. The nearest Case dealerships were located 32 miles west in Holton, Kansas, and 35 miles northeast in St. Joseph, Missouri.

Touslee Tractor and Implement Company had a Ford franchise, employed three men full time and two men from March to November. The dealer expressed a desire to hire two men full time qualified to perform all activities of the dealership. The nearest Ford dealership was located in St. Joseph, Missouri, approximately 35 miles.

Yost Motor Company had an Allis Chalmers franchise employed four men full time and two men from March to November. The dealer owned and managed the dealership for thirty-two years and all employees were forty years of age or older. The dealer said, "I would like to hire a couple of younger men qualified to do any job in the shop." The nearest Allis Chalmers dealerships were located 19 miles northwest to Everest, Kansas,

33 miles west to Holton, Kansas, and 36 miles northeast to St. Joseph, Missouri.

THE RESPONSES GIVEN BY THE DEALERS

The five Atchison farm machinery dealers averaged 4.2 persons employed full time with 2.2 persons employed during the busy seasons. This compared to 7.8 persons employed full time and 1.6 persons during the busy seasons for the five area farm machinery dealers with one dealership per town. Both groups considered their busy season from March to November.

All farm machinery dealers at the time of the study serviced and repaired the following machines: tractors, combine harvesters, combine (picker and sheller combination), mowers, mower rotary, plows, ensilage cutters, planters, cultivators, sprayers, hay balers, grain drills, hay rakes, and hay conditioners. One of the five dealers in Atchison repaired and serviced anhydrous ammonia applicators. They reported that they formerly sold them and had a qualified man and the equipment for this service. Two other dealers reported that they considered them dangerous to repair and service and that the insurance rate for both employees and buildings were higher. Seven dealers reported that they repaired and serviced small engines. All remarked that it was difficult to keep the governor and the carburetor in proper adjustment after they left the shop, and only continued the service as a public relations service. They reported that most all the small engines were in lawn mowers.

The other dealers formerly serviced and repaired small engines, but discontinued this because the cost of the labor to repair the machines was almost the same as the price of a new machine.

The small tractor equipped with tillage implements for truck gardening and mowing attachments was serviced and repaired by three dealers. One dealer had a motor truck contract with a trucking firm for repair and servicing.

When the dealers were asked the question, "Do you hire additional men during the busy seasons? If so, how many?" all dealers answered in the affirmative. The area dealers, one dealership to a town, three dealers employed two men and two dealers one man. The Atchison dealers, four employed two men and one dealer three men during the busy seasons. All dealers commented that qualified men were hard to find. The questionnaire did not include the question, "How many men would you hire full time if available and qualified?" but the author discussed this question during the interview. Six dealers said they would hire one man full time, three dealers two men and one dealer three men. This was a total of 15 men in ten dealerships.

Item number 4 asked, "What additional machines or specific services do you plan to add the next year or two?" All ten of the dealers responded, "None." They indicated that such additions would be made only as necessary to increase the efficiency and output of the dealership.

Item number 5 of the survey form asked, "Have you failed to add additional services sooner because men were not available to hire? If the answer is yes, what services?" All ten dealers answered this as a double

question, "No," for the first part concerning machines and "Yes," for the second part, concerning services. The explanation was the same as for the previous questions in that they did not intend to add more services, but rather to increase efficiency and output by trying to employ trained men. They indicated that they were already trying to perform all the services that the public was demanding.

Four Atchison dealers indicated a desire to hire men skilled in a number of services or activities rather than one. They said that because of the competition of so many other dealerships in one town there wasn't enough business to keep one man busy in one area all the time. When men are qualified they can be moved from one department to another, depending upon the demand, and the hourly wage could be increased.

One Atchison dealer lost his best tractor mechanic to the Trans World Airline plant in north Kansas City because a beginning salary of \$4.00 per hour with fringe benefits offered to him. One dealer in Atchison was training a student during the afternoons and Saturday mornings who was enrolled in the vocational training program, Atchison High School. The dealer gave high praise to the trainee. One dealer in Atchison had two town reared students enrolled in the vocational training program on two different occasions as tractor mechanics, one continued one week and the other two weeks. It was his opinion that farm reared boys would be more suitable for they would know more of what to expect. Also he said that more emphasis should be placed on counseling and selecting these students, for everyone's time is valuable.

The five area dealers had more men employed full time and placed more emphasis on men skilled in one service. One dealer had advertised in newspapers three weeks for a tractor mechanic with hourly pay of \$5.50 and had not received any reply. All dealers indicated they would like to hire one to three skilled men.

Eight dealers reported that their companies sponsored service clinics for mechanics except for the two dealers in Atchison. The training program was financed by the dealer. Three dealers reported that a total of five men accepted employment with other firms after receiving the training. All dealers reported that machinery companies held night clinics at the dealership on machinery adjustment and assembly. The parts personnel of the seven dealerships received training at a company clinic or in the agency. The sales personnel of all ten dealerships received sales training sponsored by the different companies.

The first activity listed on the questionnaire which followed the six open-end information questions and rated by the ten farm machinery dealers as "Essential" (3.0 to 4.0) points, "Very Important" (2.0 to 2.9) points, "Important" (1.0 to 1.9) points, "Little Importance" (0.1 to 0.9) points, "No Importance" (0.0) points, was given a title of Employer Employee and Customer Relationship. The responses of the dealers to this item were presented in Table I. This table consists of the eight competencies, numbered from seven to 14 inclusive. The competency number 7, "Clean and neat in appearance," was given an average rating of "Very Important" (2.8). The other six competencies were rated as "Essential"

TABLE I
EMPLOYER, EMPLOYEE, AND CUSTOMER RELATIONSHIP

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
14	Be honest and willing to admit mistakes.	3.8	3.6	3.7	.2
13	Demonstrate company's products advantageously.	3.8	3.4	3.6	.4
9	Meet and communicate favorably with customers.	3.6	3.6	3.6	.0
10	Maintain a constant vigi- lance of safety in working areas.	3.6	3.4	3.5	.2
12	Maintain high efficiency and coolness of mind during busy seasons.	3.6	3.2	3.4	.4
8	Maintain a favorable at- titude of the employer and business represen- tatives.	3.2	3.2	3.2	.0
11	Make out and figure job tickets.	2.6	3.4	3.0	.8
7	Clean and neat in ap- pearance.	3.2	2.4	2.8	.8
	Average rating	3.42	3.27	3.35	.35

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

(3.0) and above. All dealers made comments concerning competency number 7, and these comments were similar to what one dealer said, "A man is expected to soil his clothes performing some activities, but his appearance may have an undesirable influence on the customers, especially when performing an activity where cleanliness is essential, for example, working on diesel fuel injectors." Another dealer remarked, "If a man keeps himself reasonably clean at all times, his tools, and the area that he works in is also usually clean. New employees and others respond favorably from this example."

The competencies dealing with Employer, Employee and Customer Relationship, were rated with an average range of (.4) of a point higher by the area dealers, one to a town, not including competency number 9, "Meet and communicate favorably with customers," which was given the same rating (3.6) and competency number 11, "Make out and figure job tickets," a range of (.8) of a point lower than the Atchison dealers. It was the findings of the author that the Atchison dealers' employees individually made out job tickets on the work that they did and the area dealers, the shop foreman performed this duty.

The first five competencies of the 33 under the activity Servicing Tractors are presented in Table II in the order of importance as they were rated by the ten farm machinery dealers. Competency number 37, "Test horsepower with the PTO dynamometer," received the highest rating of all the competencies in the study, (4.0) points, as "Essential." All dealerships owned PTO dynamometers except two in Atchison and they

TABLE II
SERVICING TRACTORS

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
37	Test horsepower with PTO dynamometer.	4.0	4.0	4.0	.0
23	Inspect, clean, adjust and replace fuel injectors.	4.0	3.2	3.6	.8
33	Have a knowledge of the proper use of fire extinguishers.	3.8	3.0	3.4	.8
29	Understand the importance of properly cleaning the engine ventilation system.	3.6	3.2	3.4	.4
21	Properly time the engine correctly, using the timing light.	3.6	3.0	3.3	.6
	Average rating	3.8	3.28	3.46	.52

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

used other dealers' machines until they purchase one. All dealers considered the PTO dynamometer a brain for checking tractors for servicing and overhaul. One dealer said, "We used the dynamometer to break in a tractor after overhaul." A dealer in Atchison reported, "The PTO dynamometer has been a great help in speeding up my used tractor transactions." Competency number 29, "Understand the importance of properly cleaning the engine ventilation system," which received a rating of

"Essential" (3.4) points, drew this comment from a dealer, "Our PTO dynamometer brought out the importance of this by reducing the pull about 20 horsepower."

The six ability competencies continued under the activity Servicing Tractors were illustrated in Table III. All six competencies were given an average rating of "essential" (3.7) points by the area dealers. This compared to the Atchison dealers with an average rating of "Very Important" (2.76) points with an average range of (.93) points. The average rating by the ten farm machinery dealers was "Essential" (3.28) points.

TABLE III
SERVICING TRACTORS

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
22	Clean, repair and adjust carburetors.	3.8	2.8	3.3	1.0
18	Remove and properly replace ignition points.	3.8	2.8	3.3	1.0
16	Clean and winterize the cooling system.	3.8	2.6	3.2	1.2
15	Clean engines with steam cleaner.	3.6	2.8	3.2	.8
30	Change the crankcase oil and lubricate the engine.	3.6	2.8	3.2	.8
34	Clean, pack and adjust wheel bearings.	3.6	2.8	3.2	.8
	Average rating	3.7	2.76	3.28	.93

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

Competency number 16, "Clean and winterize the cooling system," drew this comment from a dealer, "Improper cleaning of the cooling system or neglect to clean it can cause the engine to heat up, decrease power, increase fuel consumption and cause increased wear." Another dealer commented, "People use all kinds of water in tractor radiators and this practice has given problems."

Three dealers in Atchison made comments concerning competency number 15, "Clean engines with steam cleaner," "Steam takes the paint off if you aren't careful, we use the car wash here in town."

Competency number 34, "Clean, pack, and adjust wheel bearings," drew comments from four dealers similar to what one said, "Most tractors three or four years old usually need new wheel bearings, because they haven't been properly serviced and adjusted."

The eight ability competencies continued under the activity Servicing Tractors, presented in Table IV, listed in the order of importance as they rated by the ten Farm Machinery Dealers. All competencies were given an average rating of "Essential," (3.05) points, with an average range of (0.51). The Atchison dealers rated them as "Very Important" with an exception of an "Essential" rating for competency number 32 "Handle engine fuels, oils and greases safely." One dealer said, "The danger of fires are with us all the time and I make sure all the employees are aware of the danger, know where the fire extinguishers are located and how to use them."

TABLE IV
SERVICING TRACTORS

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
19	Test coil and condenser, trace the primary and secondary circuits for bad wiring cracks and breaks.	3.4	2.8	3.1	.6
24	Test, clean, remove, completely recondition and install generators and/or alternators.	3.4	2.8	3.1	.6
25	Check, adjust and install voltage regulators.	3.4	2.8	3.1	.6
32	Handle engine fuels, oils and greases safely.	3.2	3.0	3.1	.2
27	Test, clean, recharge and install batteries.	3.2	2.8	3.0	.4
35	Check exhaust system for leaks, repair and/or replace.	3.2	2.8	3.0	.4
36	Adjust clutch and/or replace clutch lining.	3.4	2.6	3.0	.8
	Average rating	3.31	2.8	3.05	.51

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

The remaining five ability competencies under the activity Servicing Tractors, presented in Table V, were given a rating of "Very Important," (2.78) points with a deviation of (.36) of a point. The five area dealers rated the competency number 20, "Inspect, test, clean, set and replace spark plugs," as "Essential," (3.2) points. One dealer said, "We always install new spark plugs, because the cost of new plugs is as economical as the cost of time spent cleaning and testing the old ones. But it is essential that men should have the knowledge and skill checking spark plugs, for we have had new plugs that didn't test out." All dealers rated competency number 31, "Understand the weights of oils and greases and the purposes of additives," as "Very Important," 2.6. Six dealers made comments and their comments were similar to what one dealer said, "All Tractors Operator's Manuals specify the weights of oils and greases to use and the number of hours in operation for oil changes, including lubrication; however, customers ask questions and a knowledgeable answer will help develop their confidence in our service department."

The twenty-four ability competencies concerning the activity, Tractor Overhaul were rated by the ten farm machinery dealers as "Essential," and are presented in Tables VI, VII, VIII, and IX, in the order of their importance. In Table VI, competency number 43, "Ability to grind and seat valves properly," and competency number 44, "Fit piston wrist pins with connecting rods properly," were both rated as "Essential," (3.8). One Atchison dealer said, "The ability to grind

TABLE V
SERVICING TRACTORS

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
20	Inspect, test, clean, set and replace spark plugs.	3.2	2.6	2.9	.6
28	Inspect, replace and adjust V-belts.	3.2	2.6	2.9	.6
17	Check radiator pressure caps and understand their importance.	3.0	2.6	2.8	.4
26	Clean, repair and/or install instrument panel gauges, electrical wiring including lights.	2.8	2.6	2.7	.2
31	Understand the weights of oils and greases and the purposes of additives.	2.6	2.6	2.6	.0
	Average rating	2.96	2.6	2.78	.36

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

and seat valves properly is highly essential and is usually required on all overhauls and sometimes for tractor tune-up." Another dealer remarked, "The failure to replace worn valve guides and using a pilot that isn't worn when using the valve seat grinder, can make the difference between a good and poor job." Another dealer made comment concerning competency number 48, "Use reference manuals for obtaining exact and specific information for engine overhaul," "I would rather a mechanic

TABLE VI
TRACTOR OVERHAUL

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
43	Ability to grind and seat valves properly.	4.0	3.6	3.8	.4
44	Fit piston wrist pins with connecting rods properly.	4.0	3.6	3.8	.4
45	Prepare pistons and fit new rings for installation.	4.0	3.4	3.7	.6
46	Prepare engine block and install pistons.	4.0	3.4	3.7	.6
47	Fit connecting rods and main bearings for proper running tolerance.	4.0	3.4	3.7	.6
48	Use reference manuals for obtaining exact and specific information for engine overhaul.	4.0	3.4	3.7	.6
	Average rating	4.0	3.47	3.73	.533

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

spend a little time looking up information, rather than trusting his memory and later have to do the job over. Some customers frown on this and take their business elsewhere."

The six ability competencies presented in Table VII were rated by the ten farm machinery dealers as "Essential" with an average rating of (3.66) and a deviation of (0.66) between the Atchison dealers and the area dealers. One Atchison dealer reported concerning competency

TABLE VII
TRACTOR OVERHAUL

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
50	Proper use of torque wrench to assemble an engine.	4.0	3.4	3.7	.6
51	Align engine components so as to insure correct engine timing.	4.0	3.4	3.7	.6
52	Importance in using cylinder head tightening sequence.	4.0	3.4	3.7	.6
55	Check crankshaft for flat spots and end play.	4.0	3.4	3.7	.6
42	Familiar with measuring devices used in engine overhaul.	4.0	3.2	3.6	.8
58	Remove and replace worn oil pump parts to specifications.	4.0	3.2	3.6	.8
	Average rating	4.0	3.33	3.66	.66

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

number 50, "Proper use of torque wrench to assemble an engine," he said, "The torque wrench that is adjustable and clicks when the pressure is reached is superior to the dial type. Also it is time saving, especially when a series of bolts are tightened in succession using the same pressure." Another dealer made this statement with reference to competency number 58, "Remove and replace worn oil pump parts to specifications,"

"I have had mechanics fail to check the oil pump, which later was sighted for being the reason of the overhaul in the beginning."

The seven ability competencies a continuation of the activity, Tractor Overhaul, are presented in Table VIII, were rated as "Essential," with an average rating of (3.5) points, and a deviation of (0.37) points, between the area dealers and the Atchison dealers. With reference to competency 57, "Check camshaft for lobe wear," one dealer said, "Very seldom do we find lobe wear, but it is essential that they be checked for good business." Another dealer reported in reply to competency number 49, "Install gaskets properly," "With the high compression engines this is becoming more important and some gaskets turned upside down give trouble." Another dealer reported concerning competency number 54, "Check valve spring tension," "We check all valve springs and find some that need replacing." With reference to competency number 61, "Remove twisted off bolts with easy-outs and recondition threads," one dealer said, "This is essential, for this is an operation that we have every day, and we have found that if you use a "Ridig" type easy-out that drives in instead of the screw-in type, you never break the easy-out off in the hole."

The five ability competencies presented in Table IX under the activity Tractor Overhaul were rated lower by the ten farm machinery dealers, but considered "Essential" with an average rating of (3.22) points and a range of (.44) points. The Atchison dealers rated the competency number 59 "Remove and replace water pump bearings" as "Very

TABLE VIII
TRACTOR OVERHAUL

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
57	Check camshaft for lobe wear.	3.8	3.4	3.6	.4
60	Accurate in measuring cylinders and crankshafts.	4.0	3.2	3.6	.8
49	Install gaskets properly.	3.6	3.4	3.5	.2
53	Remove, clean and replace hydraulic valve lifters.	3.6	3.4	3.5	.2
56	Replace camshaft bearings.	3.8	3.2	3.5	.6
54	Check valve spring tension.	3.6	3.2	3.4	.4
61	Remove twisted off bolts with easy-outs and recondition threads.	3.4	3.4	3.4	.0
	Average rating	3.68	3.31	3.5	.37

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

Important" with a rating of (2.8) points, compared to the area dealers as (3.6) points, a deviation of (.8) of a point. Two Atchison dealers said, "We use factory rebuilt waterpumps, and very seldom replace the bearings ourselves." All dealers made comments concerning competency number 39 "Ability to make tests to determine if overhaul is needed" and these comments were similar to what one dealer said,

TABLE IX
TRACTOR OVERHAUL

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
39	Ability to make tests to determine if overhaul is needed.	3.4	3.2	3.3	.2
38	Identify the characteristics of a motor overhaul rather than a need for a tune-up.	3.4	3.0	3.2	.4
40	Disassemble engine properly without damaging component parts.	3.0	3.4	3.2	.4
41	Mark, tag and identify parts for correct assembly.	3.4	3.0	3.2	.4
59	Remove and replace water pump bearings.	3.6	2.8	3.2	.8
	Average rating	3.36	3.08	3.22	.44

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

A few customers ask for an overhaul, but the majority bring their tractors in for servicing. The ignition and carburetor system are checked and the tractor is tested with the PTO dynamometer to determine the horsepower and compare it to factory specifications. At this point we must be honest, and let the customer make the final decision. The season of the year, how much the tractor will be used and the number of tractors on the waiting list in the shop for overhaul are points for consideration. Some customers ask for an overhaul when only servicing is required.

The eight ability competencies under the activity Hydraulic Systems, presented in Table X, listed in the order of their importance, rated by the ten farm machinery dealers, were rated as "Essential" with an average of (3.4) points, and a range of (0.275) of a point. All dealers made a comment similar to what one dealer said,

Our greatest problem is keeping dirt out of the system, and removing it after it is in the system. Most farmers fail to recognize the importance of cleaning off the hose connections when mounting various pieces of machinery on the tractor, utilizing the tractor hydraulic system to operate the machine in the field.

Two dealers made this comment with reference to competency 63, "Repair hydraulic pumps," "We send them into the factory for repair."

TABLE X

HYDRAULIC SYSTEM

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
66	Repair control valves.	3.8	3.4	3.6	.4
68	Service system filters	3.8	3.4	3.6	.4
69	Operate system analyzer.	3.8	3.4	3.6	.4
62	Recognize the need for service or repair through proper trouble shooting procedure.	3.6	3.4	3.5	.2
63	Repair hydraulic pumps.	3.6	3.4	3.5	.2
67	Select hydraulic oils.	3.6	3.4	3.5	.2
64	Repair hydraulic cylinders.	3.2	3.4	3.3	.2
65	Repair hose fittings.	3.4	3.2	3.3	.2
Average rating		3.6	3.375	3.48	.275

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

In the activity, Tractor Transmission and Differential, seven of the eight competencies were rated as "Essential," by the ten farm machinery dealers, presented in Table XI. Competency number 77, "Calculate gear speed ratio," received an average rating of "Very Important," (2.0) points, with a range of (0.4) of a point. The comment one dealer made was, "The gear speed ratio is determined at the factory, but a mechanic should understand how it is calculated." Another dealer made this comment in reference to competency number 75, "Accurate in measuring gears for wear and adjust to specifications," "Transmission and differential parts are expensive and the customer should be informed of the parts that should be replaced and the cost, before installing them. We put the replaced parts in a box for the customer to see and take home."

The twelve ability competencies under the activity Machinery Repair are presented in Tables XII and XIII, listed in order of their importance as rated by the ten farm machinery dealers. The six competencies in Table XII were given an average rating of "Essential," (3.18) points, with a range of (0.66) of a point. The Atchison dealers rated competencies number 78, "Weld efficiently in all positions with an electric arc welder," and number 81, "Read and follow directions in operators manual," as "Essential," (3.0) points, and the other four competencies as "Very Important." One area dealer said,

I have a man that does all of the welding in the shop and individual items that customers bring in. Many of these items were previously welded on the farm by the customer and broke the second time. The knowledge of metals and the kind of electrode to use is essential.

TABLE XI
TRACTOR TRANSMISSION AND DIFFERENTIAL

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
75	Accurate in measuring gears for wear and adjust to specifications.	3.8	3.8	3.8	.0
76	Replace worn and damaged gears in transmission and differential.	3.8	3.4	3.6	.4
72	Install oil and grease seals.	3.8	3.2	3.5	.6
70	Follow path of power through the transmission.	3.6	3.2	3.4	.4
71	Service transmission and differential gear cases.	3.6	3.2	3.4	.4
73	Remove and install anti-friction bearings.	3.4	3.2	3.3	.2
74	Repair universal joints.	3.2	3.2	3.2	.0
77	Calculate gear speed ratio.	2.2	1.8	2.0	.4
	Average rating	3.42	3.1	3.27	.3

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

With reference to competency number 79, "Weld and cut steel with gas welding equipment," four dealers made statements similar to what one dealer said, "The gas welder is real important in our shop, especially in the machinery repair department, welding thin sheet metal, heating to remove sprockets from shafts and a number of other jobs."

TABLE III
MACHINERY REPAIR

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
78	Weld efficiently in all positions with electric arc welder.	3.6	3.0	3.3	.6
81	Read and follow directions in operators manual.	3.6	3.0	3.3	.6
79	Weld and cut steel with gas welding equipment.	3.8	2.6	3.2	1.2
82	Determine maximum or minimum wear in moving parts or excessive wear for replacement.	3.4	2.8	3.1	.6
84	Operate hydraulic press with efficiency and safety.	3.4	2.8	3.1	.6
85	Operate gear pullers and other shop tools for use designed with safety.	3.4	2.8	3.1	.6
	Average rating	3.53	2.83	3.18	.66

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

The six remaining competencies in the activity Machinery Repair, presented in Table XIII, are listed in order of importance as they were rated by the ten farm machinery dealers. Competency number 80, "Disassemble a machine and reassemble it efficiently in limited time," rated as "Essential," (3.0) points, drew this comment from one dealer. "It is my experience that most men remove more parts than it is necessary to

TABLE XIII
MACHINERY REPAIR

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
80	Disassemble a machine and reassemble it efficiently in limited time.	3.2	2.8	3.0	.4
83	Loosen frozen, rusted or corroded parts without damage.	3.2	2.8	3.0	.4
87	Operate paint sprayer.	3.2	2.4	2.8	.8
86	Prepare machinery to paint.	3.2	2.2	2.7	1.0
88	Calibrate operating RPM of machine running parts.	2.2	2.2	2.2	.0
89	Calculate pulley and sprocket speed ratio.	1.0	1.6	1.3	.6
	Average rating	2.66	2.33	2.5	.53

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

replace a broken or worn part and it takes more time to reassemble the machine. Taking a few minutes to study the operators manual can save a lot of time." Competency number 89, calculate pulley and sprocket speed ratio," was rated as "Important," (1.3) points by the ten farm machinery dealers. One dealer said, "The implement companies figure this out, but I have seen some machines with different size sprockets that were interchangeable and in this case it would be important to be able to figure the sprocket speed ratio."

The four ability competencies under the activity Machinery Repair, presented in Table XIV, were given a rating of "Essential," by the farm machinery dealers, one to a town. The Atchison dealers only rated competency number 90 as "Essential," (3.0) points, "Read and follow step by step the procedure in the operators manual in making adjustments." All dealers made comments similar to what one dealer said, "it is essential that the man be able to read, understand, and follow what he reads." Competency number 92, "Ability to diagnose improper adjustment immediately," was given an average rating of "Essential," (3.1) points, drew this comment from one dealer, "Some machines are worn out without being properly adjusted. An ill adjusted machine loses business for the dealer and the implement company."

The six ability competencies of the activity Machinery Assembly, presented in Table XV, are listed in order of importance as they were rated by the ten farm machinery dealers. Competency number 94, "Read instruction manuals and follow directions in setting up new machines," was rated as "Essential," (3.2) points, with a range of (0.4) of a point. All dealers reported that it was almost impossible to set up new machines without following the instruction manual, step by step. One dealer's comment with reference to competency number 97, "To operate farm machinery from past experience be of value in setting up new machinery," "I have noticed that it takes about one-half the time for men who have operated a machine, to set it up the first time, compared to men who haven't." The competency was rated as "Very Important," (2.7) points, by the ten

TABLE XIV
MACHINERY ADJUSTMENT

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
90	Read and follow step by step the procedure in the operators manual in making adjustments.	3.4	3.0	3.2	.4
92	Ability to diagnose improper adjustment immediately.	3.4	2.8	3.1	.6
91	Make minor correction adjustments for efficient operation under adverse conditions.	3.2	2.6	2.9	.6
93	Be systematic in making adjustments.	3.4	2.2	2.8	1.2
	Average rating	3.35	2.65	3.0	.7

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

farm machinery dealers. Competency number 99, "To use speed and impact wrenches," rated as "Essential," (3.2) points, was considered by one dealer to replace one man in the machinery assembly department. One Atchison dealer said, "I never had any success with electric impact wrenches, it seems that they were always in the shop being repaired. Air impact wrenches cost more, but they have more power and last many times longer."

TABLE XV
MACHINERY ASSEMBLY

Question- naire No.	Ability Competencies	Machinery Dealers		Score	
		Area N=5	Atchison N=5	Avg.	Range
94	Read instruction manuals and follow directions in setting up new machines.	3.4	3.0	3.2	.4
99	To use speed and impact wrenches.	3.4	3.0	3.2	.4
95	Have knowledge of different types of bolts, threads and hardware used in assembling machinery.	3.4	2.4	2.9	1.0
97	To operate farm machines from past experience be of value in setting up new machinery.	2.8	2.6	2.7	.2
98	To know how much pressure some bolts can withstand compared to others to prevent stripping when tightened.	2.4	2.8	2.6	.4
96	To manipulate the hands, arms and body in close quarters in order to fit bolts and nuts.	2.2	2.0	2.1	.2
	Average rating	2.93	2.63	2.78	.43

Note: Essential, 4 points
 Very Important, 3 points
 Important, 2 points
 Little Importance, 1 point
 No Importance, 0 points

SUMMARY

This report concerned a study of the competencies which were needed by employees of farm machinery dealers for gainful employment in northeast Kansas.

The study resulted from many observations made by the writer, a teacher of vocational agriculture for 19 years before the study was made. One observation centered about the increase of vocational agriculture graduates seeking non-farm employment after graduation from the Atchison County Community High School, Effingham, Kansas. This trend was observed to increase from 5.4 per cent in 1945 to 24 per cent of the graduates in 1965. This condition had developed, it was assumed, because of the rising economic conditions and the amount of capital required for young men to become established in farming.

It was further an observation that the increased investment in farm machinery designed to save the farmer time and labor had increased the volume of business with farm machinery dealers. The high demand for immediate delivery of new machines, the repair and servicing of old machines had increased the demand for more skilled men.

It had been the experience of the writer that farm machinery dealers had asked instructors of vocational agriculture to train boys for farm machinery dealers employment after graduation. The author further made the study in an effort to assist farm machinery dealers in obtaining skilled men for employment.

The central problem of the study was to discover some competencies needed by employees of farm machinery dealers in order that vocational

agriculture departments, vocational technical schools, and junior colleges could qualify their graduates for gainful employment with farm machinery dealers. The problem was designed to provide guide lines for a curriculum for training for all areas of activity in all farm machinery dealerships.

Seven objectives were listed for this study.

1. To survey what competencies farm machinery dealers consider were required for gainful employment.
2. To formulate guide lines in developing a curriculum of training.
3. To survey the differences in the number of competencies between an employee of a farm machinery dealership where there were several to a town, and a dealership where there was several to a town.
4. To survey whether farm machinery dealers would employ additional men.
5. To survey whether farm machinery dealers sponsored clinics for training employees.
6. To develop a list of different farm machines that were reported to be repaired and serviced by farm machinery dealerships.
7. To develop a list of services which dealers intend to add within the next two years.

A questionnaire was developed to gather data which would assist in meeting the objectives of the study. Included in the questionnaire was a list of competencies which were considered to be essential to qualify men for gainful employment in farm machinery dealerships in northeast Kansas.

The instrument containing six information questions and 93 competencies involving eight areas of activity was used. The eight areas and the number of competencies for each area are as follows: employer, employee and customer relationship, eight competencies; servicing tractors, 33 competencies; tractor overhaul, 24 competencies; hydraulic system, 8 competencies; tractor transmission and differential, 8 competencies; machinery repair, 12 competencies; machinery adjustment, 4 competencies; machinery assembly, 6 competencies.

The response given to the questionnaire by the dealers was analyzed by assigning a weighted value to the responses given to items 7 through 99. Items which were rated as "Essential," were assigned 4 points, "Very Important," 3 points; "Important," 2 points; "Little Importance," 1 point; and "No Importance," 0 points.

All competencies receiving an average rating of "Essential" (3.0 to 4.0, points) were to be considered as important in developing a curriculum.

A selection of five farm machinery dealers in Atchison and five area farm machinery dealers, one to a town, were selected for the study.

The data was gathered through a personal interview with each dealer. The following competencies were considered by the dealers to be required for the gainful employment of their employees and were also the ones to be used as guide lines in the development of a curriculum for training. The competencies which are starred (*) are those which were considered to be essential by only the area dealers. The competencies

which are starred (**) were considered to be essential only by the Atchison dealers. The others were considered to be essential by both groups of dealers.

EMPLOYER, EMPLOYEE AND CUSTOMER RELATIONSHIP

Be honest and willing to admit mistakes.

Demonstrate company's products advantageously.

Meet and communicate favorably with customers.

Maintain a constant vigilance of safety in working areas.

Maintain a high efficiency and coolness of mind during busy seasons.

Maintain a favorable attitude of the employer and business representatives.

Make out and figure job tickets. (**)

SERVICING TRACTORS

Test horsepower with PTO dynamometer.

Inspect, clean, adjust and replace fuel injectors.

Have a knowledge of the proper use of fire extinguishers.

Understand the importance of properly cleaning the engine ventilation system.

Properly time the engine, using the timing light. (*)

Clean, repair and adjust carburetors. (*)

Remove and properly replace ignition points. (*)

Clean and winterize the cooling system. (*)

Clean engine with steam cleaner. (*)

Change the crankcase oil and lubricate the engine. (*)

- Clean, pack and adjust wheel bearings. (*)
- Test coil and condensor, trace the primary and secondary circuits for bad wiring cracks and breaks. (*)
- Test, clean, remove and completely recondition and install generators and/or alternators. (*)
- Check, adjust and install voltage regulators. (*)
- Handle engine fuels, oils and grease safely. (*)
- Test, clean, recharge and install batteries. (*)
- Check exhaust system for leaks, repair and/or replace. (*)
- Adjust clutch and/or replace clutch lining. (*)

TRACTOR OVERHAUL

- Ability to grind and seat valves properly.
- Fit piston wrist pins with connecting rods properly.
- Prepare pistons and fit new rings for installation.
- Prepare engine block and install pistons.
- Fit connecting rods and main bearings for proper running tolerance.
- Use reference manuals for obtaining exact and specific information for engine overhaul.
- Proper use of torque wrench to assemble an engine.
- Align engine components so as to insure correct engine timing.
- Importance in using cylinder head tightening sequence.
- Check camshaft for flat spots and end play.
- Familiar with measuring devices used in engine overhaul.
- Remove and replace worn oil pump parts to specifications.

Check camshaft for lobe wear.

Accurate in measuring cylinders and crankshafts.

Install gaskets properly.

Remove, clean and replace hydraulic valve lifters.

Replace camshaft bearings.

Check valve spring tension.

Remove twisted off bolts with easy-outs and recondition threads.

Ability to make tests to determine if overhaul is needed.

Identify the characteristics of a motor overhaul rather than a need for a tune-up.

Dissassemble engine properly without damaging components parts.

Mark, tag and identify parts for correct assembly.

Remove and replace water pump bearings.

(*)

HYDRAULIC SYSTEM

Operate system analyzer.

Service system filters.

Repair control valves.

Recognize the need for service or repair through proper shooting procedure.

Repair hydraulic pumps.

Select hydraulic oils.

Repair hydraulic cylinders.

Repair hose fittings.

TRACTOR TRANSMISSION AND DIFFERENTIAL

Accurate in measuring gears for wear and adjust to specifications.

Replace worn and damaged gears in the transmission and differential.

Install oil and grease seals.

Follow path of power through the transmission.

Service transmission and differential gear cases.

Remove and install anti-friction bearings.

Repair universal joints.

MACHINERY REPAIR

Weld efficiently in all positions with electric arc welder.

Read and follow directions in operators manual.

Weld and cut steel with gas welding equipment. (*)

Determine maximum or minimum wear in moving parts or excessive wear for replacement. (*)

Operate hydraulic press with efficiency and safety. (*)

Operate gear pullers and other shop tools for use designed with safety. (*)

Disassemble a machine and reassemble it efficiently in limited time. (*)

Loosen frozen, rusted or corroded parts without damage. (*)

Operate paint sprayer. (*)

Prepare machinery to paint. (*)

MACHINERY ADJUSTMENT

Read and follow step by step the procedure in the operators manual in making adjustments.

Ability to diagnose improper adjustment immediately. (*)

Make minor correction adjustments for efficient operation under adverse conditions. (*)

Be systematic in making adjustments. (*)

MACHINERY ASSEMBLY

Read instruction manuals and follow directions in setting up new machines.

Have knowledge of different types of bolts, threads and hardware used in assembling machinery. (*)

To use speed and impact wrenches.

All ten dealers would employ one to three men full time if they were qualified. Dealers indicated that they would hire fifteen men as follows: six dealers, one man; three dealers, two men; and one dealer, three men.

Eight dealers reported that their companies sponsored service clinics for mechanics financed by the dealer. All dealers reported that machinery companies held night clinics at the dealership on machinery adjustment and assembly. The parts personnel of seven dealerships received training at the company clinics or in the dealership. The sales personnel received sales training sponsored by the different companies.

All farm machinery dealers at the time of the study serviced and repaired the following machines: tractors; combine harvesters, combine (picker and sheller combination); mowers; mower (rotary); plows; ensilage cutters; planters; cultivators; sprayers; hay balers; grain drills; hay rakes; and hay conditioners. One dealer serviced and repaired anhydrous ammonia applicators. Seven dealers serviced and repaired small engines. Three dealers sold, repaired and serviced small garden tractors.

All ten dealers reported that they did not intend to add any new services in the next two years. Such additions would be made only as necessary to increase the efficiency and output of the dealership.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Agan, R. J. "Kansas Studies Agriculture Non-farm Occupations," Agriculture Education Magazine, July, 1964.
- Bradley, Howard R. "Agriculture in Kansas Area Vocational Schools," Agriculture Education Magazine, April, 1965.
- Engelking, Harold F. "The Birth of a Program," Agriculture Education Magazine, March, 1966.
- Kahler, Alan A., and Clarence E. Bundy. "Competencies Needed for the Farm Machinery Worker," Agriculture Education Magazine, April, 1965.
- Kansas State Board of Agriculture, 35th Biennial Report, 1945-1946 (Fred Voiland, Jr., State Printer, Topeka, Kansas, 1946).
- Kansas State Board of Agriculture, Farm Facts, 1965-1966 (Robert R. Sanders, State Printer, Topeka, Kansas, 1966).
- Roberson, Norman N., and Duane L. Blake. "Content for Today's Farm Machinery Instruction," Agricultural Education Magazine, March, 1965.
- World Atlas, Hammond Incorporated, Copyright, 1966, (Maplewood, New Jersey).

APPENDIX

ATCHISON COUNTY COMMUNITY HIGH SCHOOL

Lee R. Cashman, Principal

Effingham, Kansas

September 19, 1966

Mr. J. Keith Melvin, Executive Secretary
Western Retail Implement and Hardware Association
638 West 39th Street
Kansas City, Missouri 64111

Dear Mr. Melvin:

In partial fulfillment toward a Masters Degree, Kansas State University, I am making a study of Farm Machinery Dealers in northeast Kansas to determine what studies and skills that should be included for farm boys enrolled in Vocational Agriculture Courses in High School for occupational employment after graduation. Not all farm boys return to the farm or continue their education, therefore, a number of boys may be employed by Farm Machinery Dealers if they receive additional training in high school.

I would appreciate your cooperation in sending me a list of Farm Machinery Dealers in northeast Kansas, that have five or more men employed. I have enclosed a list of towns located in the area that I am interested in. Some of the towns may not have a Farm Machinery Dealer and some may have several.

Where possible, would you be able to give me the name of the manager or owner.

Thanking you very kindly for your assistance.

Sincerely,

Roy F. Eck, Instructor
Vocational Agriculture

LIST OF TOWNS LOCATED IN NORTHEAST KANSAS

Atchison	Troy
Bendena	Valley Falls
Denton	Wathena
Easton	Wetmore
Everest	Whiting
Fairview	Winchester
Goff	Soldier
Hiawatha	White Cloud
Highland	Sparks
Holton	
Horton	
Hoyt	
Leavenworth	
Mayetta	
Meriden	
Netawaka	
Nortonville	
Oskaloosa	
Robinson	
Sabetha	
Severance	
Tonganoxie	

Western Retail Implement and Hardware Association
638 West 39th Street
Kansas City, Missouri 64111

Mr. Roy F. Eck
Instructor - Vocational Agriculture
Future Farmers of America
Atchison County FFA Chapter
Atchison County Community High School
Effingham, Kansas

Dear Mr. Eck:

Enclosed is a list of implement dealers we have on our records
in the towns you mentioned.

It would be quite interesting to us to see a summary of the
information you obtain as a result of your study.

Very truly yours,

(Signed) J. K. Melvin

J. Keith Melvin
Executive Director

JKM:mg

LIST OF IMPLEMENT DEALERS

D & W Tractor Service
Wayne Blanton & Delbert Bomberger
2000 Main Street
Atchison, Kansas 66002

Allen Motor & Implement Co
Glenn Allen
20th & Main
Atchison, Kansas 66002

Handke Implement Co.
Edward R. Handke
1215 Main
Atchison, Kansas 66002

Svensson Implement & Repair Co.
V. C. Svensson
711 Main Street
Atchison, Kansas 66002

Yost Motor Company
Ernest Yost
117 S. 8th St.
Atchison, Kansas 66002

Estes Motor and Farm Service
RR#3
Atchison, Kansas 66002

Touslee Tr. & Implement Co.
1605 Main
Atchison, Kansas 66002

Hutchison Implement Co.
Donnie Mauslein
P.O. Box 145
Everest, Kansas

Wikle Implement Co.
Leslie W. Wikle
P.O. Box 65
Fairview, Kansas

Bevan Motor Co.
R. D. Bevan
807 Utah St.
Hiawatha, Kansas 66434

Cowan Implement & Coal Co., Inc.
D. W. Cowan
710 Utah St.
Hiawatha, Kansas 66434

Shockley Implement Co.
John Shockley
105 N. 8th St.
Hiawatha, Kansas 66434

Tom Miller Implement Co.
P.O. Box #2
Highland, Kansas 66035

Dannenberg Implement Co.
Robert Dannenberg
104 W. 5th Street
Holton, Kansas 66436

Eubanks Auto & Implement Co.
Roy Eubanks
216 E. 5th
Holton, Kansas 66436

Sourk Implement Co.
Robert G. Sourk
Box 271
Holton, Kansas 66436

Symons Truck & Tractor Co.
Vic T. Symons
625 Vermont Street
Holton, Kansas

R & S Implement Co.
Bob Ireland
4th Ave. E. & 15th St.
Horton, Kansas 66439

Farmer's Supply, Inc.
721 Cherokee
Leavenworth, Kansas 66048

F. G. Frederick & Sons
Francis Frederick
742 Cherokee St.
Leavenworth, Kansas 66048

Wright Truck & Tractor
Roy W. Wright
727 Shawnee
Leavenworth, Kansas 66048

Leighton Garage
C. A. Leighton
Nortonville, Kansas 66060

Weishaar Bros., Inc.,
LeRoy Weishaar
P.O. Box 268
Nortonville, Kansas 66060

Carl's Farm Center
Carl Metzger
219 Jefferson Street
Oskaloosa, Kansas 66066

Flentie's, Inc.
J. L. Flentie
15 N. 75 Hiway - P.O. Box 107
Sabetha, Kansas 66534

Nemaha Motor and Implement Co., Inc.
Chet Bloom
Box 228
Sabetha, Kansas 66534

Sabetha Implement Co.
S. B. Cook
Sabetha, Kansas 66534

Steiner Implement Company
R. E. Steiner
Sabetha, Kansas 66534

Doniphan County Equipment, Inc.
Andrew W. Franken
P. O. Box 217
Troy, Kansas 66087

Valley Implement, Inc.
Joe C. Weishaar
Valley Falls, Kansas 66088

UNIFIED SCHOOL DISTRICT NO. 377

Atchison County Effingham, Kansas 66023

Lee R. Cashman, Superintendent

In partial fulfillment of requirements for my Master's Degree from Kansas State University, Manhattan, Kansas, I am making a study to determine the competencies that should be taught in Farm Power and Machinery Courses in vocational classes of our area senior high schools, junior colleges, and the vocational technical schools. The training given to students enrolled in such classes is to qualify them for gainful employment upon graduation in Farm Machinery Dealerships.

I am asking the cooperation of the Farm Machinery Dealers in Northeast Kansas to assist me in my study.

Not all farm boys return to the farm or attend college after their graduation from high school. Thus a number of boys could be employed by Farm Machinery Dealers if they had additional training. A number of dealers have indicated to me that they have difficulty employing qualified men, and that training them on the job is expensive and slows down production.

Mr. Melvin Deckard, Director of the Atchison Area Vocational Technical School for Northeast Kansas, has indicated a keen interest in the study and is considering using the findings in setting up a training program.

Your name was given to me as one who has the experience and ability to help me in my study. I hope you will give me one hour of your time for a personal interview at which time we will go over the enclosed questionnaire. I will telephone you soon to set a date and time convenient with you for this interview.

You will be of invaluable help to me in this study and your cooperation will be appreciated. All information given to me will be held in the strictest confidence.

Sincerely,

Roy F. Eck, Instructor
Vocational Agriculture

Approval

Lee R. Cashman, Superintendent

INTERVIEW STATEMENT

This questionnaire will be used to establish guide lines for determining what should be taught in farm power and machinery courses in Vocational Schools of Senior High Schools, Area Vocational Technical Schools, and Junior Colleges. It is important that the students receive the kind of training that will qualify them for gainful employment with Farm Machinery Dealerships.

The questionnaire contains a number of competencies that an employee may be expected to perform and some may be more important than others. You are to determine whether each of the competencies are essential, very important, important, little importance, or no importance for the performance of employment in some phase of the farm power and machinery industry even though the competency may not be needed by workers in your place of business. If you have any comment or can't decide on your answer, I will circle the number of the competency and after completing all the competencies, return to the circled numbers for further discussion.

FARM POWER AND MACHINERY
COMPETENCY QUESTIONNAIRE

Firm: _____

By: _____ (Owner & Manager or Owner or Manager)

1. How many persons are employed by your firm full time? _____
2. Do you hire additional men during the busy seasons? _____ If so, how many? _____ During what months? _____
3. What different farm machines does your firm service and repair? (If firm services use (S), if firm repairs use (R)).
Tractors____, Combine Harvesters____, Combine (Picker and Sheller combination)____, Mowers____, Mowers Rotary____, Plows____, Ensilage Cutters____, Planters____, Cultivators____, Sprayers____, Balers____, Grain Drills____, Hay Rakes____, Hay Conditioners____, Anhydrous Ammonia Applicators____, Small Engines____, Others _____
4. What additional machines or specific services do you plan to add the next year or two? _____
5. Have you failed to add additional services sooner, because men were not available to hire? _____. If the answer is yes, what services?

6. Does your Company sponsor dealer service clinics for Mechanics____, Machinery adjusters____, Parts personnel____, Machinery assemblers____, Sales personnel____? Others _____

EMPLOYER, EMPLOYEE AND CUSTOMER RELATIONSHIP

The questionnaire is completed by marking (X) in the appropriate column representing your opinion on each of the competencies. The general meaning of each of the number values is:

- 4 = Essential, highly necessary, etc.
 3 = Very important, above average, etc.
 2 = Important, average moderate, etc.
 1 = Little importance, low, slight, etc.
 0 = No importance, none, not valuable, etc.

	4	3	2	1	0
	Essential	Very Important	Important	Little Importance	No Importance
7. Clean and neat in appearance.					
8. Maintain a favorable attitude toward the employer and business representatives.					
9. Meet and communicate favorably with customers.					
10. Maintain a constant vigilance of safety in working areas.					
11. Make out and figure job tickets.					
12. Maintain high efficiency and coolness of mind during busy seasons.					
13. Demonstrate Company's products advantageously.					
14. Be honest and willing to admit mistakes.					
SERVICING TRACTORS					
ABILITIES					
15. Clean engines with steam cleaner.					
16. Clean and winterize the cooling system.					
17. Check radiator pressure caps and understand their importance.					
18. Remove and properly replace ignition points.					

	4	3	2	1	0
	Essential	Very Important	Important	Little Importance	No Importance
19. Test coil and condensor, trace the primary and secondary circuits for bad wiring cracks and breaks.					
20. Inspect, test, clean, set and replace spark plugs.					
21. Properly time engine correctly, using the timing light.					
22. Clean repair and adjust carburetors.					
23. Inspect, clean, adjust and replace fuel injectors.					
24. Test, clean, remove, completely recondition and install generators and/or alternators.					
25. Check, adjust and install voltage regulators.					
26. Clean, repair and/or install instrument panel gauges, electrical wiring including lights.					
27. Test, clean, re-charge and install batteries.					
28. Inspect, replace and adjust V-belts.					
29. Understand the importance of properly cleaning the engine ventilation system.					
30. Change the crankcase oil and lubricate the engine.					
31. Understand the weights of oils and greases and the purposes of additives.					

	4	3	2	1	0
	Essential	Very Important	Important	Little Importance	No Importance
32. Handle engine fuels, oils and greases safely.					
33. Have a knowledge of proper use of fire extinguishers.					
34. Clean pack and adjust wheel bearings.					
35. Check exhaust system for leaks, repair and/or replace.					
36. Adjust clutch and/or replace clutch lining.					
37. Test horsepower with PTO dynamometer.					
TRACTOR OVERHAUL					
ABILITIES					
38. Identify the characteristics of a motor overhaul rather than a need for a tune-up.					
39. Ability to make tests to determine if overhaul is needed.					
40. Disassemble engine properly without damaging component parts.					
41. Mark, tag and identify parts for correct assembly.					
42. Familiar with measuring devices used in engine overhaul.					
43. Ability to grind and seat valves properly.					
44. Fit piston wrist pins with connecting rods properly.					

	4	3	2	1	0
	Essential	Very Important	Important	Little Importance	No Importance
45. Prepare pistons and fit new ring for installation.					
46. Prepare engine block and install pistons.					
47. Fit connecting rod and main bearings for proper running tolerance.					
48. Use reference manuals for obtaining exact and specific information for engine overhaul.					
49. Install gaskets properly.					
50. Proper use of torque wrench to assemble an engine.					
51. Align engine components so as to insure correct engine timing.					
52. Importance in using cylinder head tightening sequence.					
53. Remove, clean and replace hydraulic valve lifters.					
54. Check valve spring tension.					
55. Check crankshaft for flat spots and end play.					
56. Replace camshaft bearings.					
57. Check camshaft for lobe wear.					
58. Remove and replace worn oil pump parts to specifications.					

	4	3	2	1	0
	Essential	Very important	Important	Little importance	No importance
59. Remove and replace water pump bearings.					
60. Accurate in measuring cylinders and crankshaft.					
61. Remove twisted off bolts with easy-outs and re-condition threads.					
HYDRAULIC SYSTEM					
ABILITIES					
62. Recognize the need for service or repair through proper trouble shooting procedure.					
63. Repair hydraulic pumps.					
64. Repair hydraulic cylinders.					
65. Replace hose fittings.					
66. Repair control valves.					
67. Select hydraulic oils.					
68. Service system filters.					
69. Operate system analyzer.					
TRACTOR TRANSMISSION AND DIFFERENTIAL					
ABILITIES					
70. Follow path of power through the transmission.					
71. Service transmission and differential gear cases.					

	4	3	2	1	0
	Essential	Very Important	Important	Little Importance	No Importance
72. Install oil and grease seals.					
73. Remove and install antifriction bearings.					
74. Repair universal joints.					
75. Accurate in measuring gears for wear and adjust to specifications.					
76. Replace worn and damaged gears in transmission and differential.					
77. Calculate gear speed ratio.					
MACHINERY REPAIR					
ABILITIES					
78. Weld efficiently in all positions with electric arc welder.					
79. Weld and cut iron and steel with gas welding equipment.					
80. Disassemble a machine and reassemble it efficiently in limited time.					
81. Read and follow directions in operators manual.					
82. Determine maximum or minimum wear in moving parts or excessive wear for replacement.					
83. Loosen froze, rusted or corroded parts without damage.					

	4	3	2	1	0
	Essential	Very Important	Important	Little Importance	No Importance
84. Operate hydraulic press with efficiency and safety.					
85. Operate gear pullers and other shop tools for use designed with safety.					
86. Prepare machinery to paint.					
87. Operate paint sprayer.					
88. Calibrate operating RPM of machine running parts.					
89. Calculate pulley and sprocket speed ratio.					
MACHINERY ADJUSTMENTS					
ABILITIES					
90. Read and follow step by step the procedure in the operator's manual in making adjustments.					
91. Make minor correction adjustments for efficient operation under adverse conditions.					
92. Ability to diagnose improper adjustment immediately.					
93. Be systematic in making adjustments.					

	4	3	2	1	0
	Essential	Very Important	Important	Little Importance	No Importance
MACHINERY ASSEMBLY					
ABILITIES					
94. Read instruction manuals and follow directions in setting up new machines.					
95. Have knowledge of different types of bolts, threads and hardware used in assembling machinery.					
96. To manipulate the hands, arms and body in close quarters in order to fit bolts and nuts.					
97. To operate farm machines from past experience be of value in setting up new machinery.					
98. To know how much pressure some bolts can withstand compared to others to prevent stripping when tightened.					
99. To use speed and impact wrenches.					

COMPETENCIES FOR GAINFUL EMPLOYMENT BY DEALERSHIPS OF THE
FARM MACHINERY INDUSTRY IN NORTHEAST KANSAS

by

ROY FRANCIS ECK

B. S., University of Missouri, 1942

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1967

This report concerned a study of the competencies which were needed by employees of farm machinery dealers for gainful employment in northeast Kansas.

The central problem of the study was to discover some competencies needed by employees of farm machinery dealers in order that vocational agriculture departments, vocational technical schools and junior colleges could qualify their graduates for gainful employment with farm machinery dealers.

Seven objectives were listed for this study and they were as follows: to survey what competencies farm machinery dealers felt were required for employment; to formulate guide lines in developing a curriculum of training; to survey the differences in training requirements of an employee in farm machinery dealerships where there were several to a town compared to one dealership to a town; to survey whether dealerships would employ additional men; to survey whether farm machinery companies sponsor clinics for training employees; to develop a list of the farm machines which are repaired and serviced; and to develop a list of the services which dealers intended to add.

The responses given to the questionnaire by the dealers were analyzed by assigning a weighted value. Items which were rated as "essential," were assigned 4 points; "very important," 3 points; "important," 2 points; "little importance," one point; and "no importance," 0 points.

All competencies receiving an average rating of "essential," (3.0 to 4.0 points) were to be considered as important in developing a training curriculum.

The ten farm machinery dealers rated 75 from a total of 93 competencies as "essential," (3.0 to 4.0 points) for employment in the farm machinery industry. These 75 competencies could be considered by the vocational agriculture departments, vocational technical schools, and junior colleges, in developing a curricula for educating personnel for gainful employment with farm machinery dealers.

The area farm machinery dealers, one to a town, rated 84 of the 93 competencies as "essential," (3.0 to 4.0 points), eight as "very important," (2.0 to 2.9 points), and one as "important," (1.0 to 1.9 points). The Atchison dealers, five to a town, rated 56 as "essential," (3.0 to 4.0 points), 35 "very important," (2.0 to 2.9 points), and two as "important," (1.0 to 1.9 points). The area dealers rated more (30.1 per cent) of the competencies as "essential," (3.0 to 4.0 points), than did the Atchison dealers.

All ten dealers would employ from one to three men if they were qualified. Six dealers would hire one man, three dealers two men, and one dealer three men.

All companies sponsored clinics for the training of employees of dealerships. Eight dealers held clinics for mechanics with the dealers paying the tuition fees. All ten dealers had night clinics at the dealership for machinery assembly and adjustment personnel and seven

dealers had clinics for parts and sales personnel.

Fourteen machines were reported as being repaired and serviced by each of the ten dealers. The other machines which dealers reported that they repaired and serviced were as follows: small engines, seven dealers; small garden tractors, three dealers; anhydrous ammonia applicators, one dealer.

All ten dealers reported that they did not intend to add additional services unless it was necessary to increase the efficiency of the dealership.

